



October 05, 2016

Meagan E. Ormand Golder Associates Inc. 2108 W. Laburnum Ave. Suite 200 Richmond, VA 23227

RE: Project: Bremo Weekly Process Pace Project No.: 92314512

### Dear Meagan Ormand:

Enclosed are the analytical results for sample(s) received by the laboratory on October 03, 2016. The results relate only to the samples included in this report. Results reported herein conform to the most current, applicable TNI/NELAC standards and the laboratory's Quality Assurance Manual, where applicable, unless otherwise noted in the body of the report.

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

Nicole Gasiorowski

Micolo Lassorouske

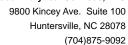
nicole.gasiorowski@pacelabs.com

**Project Manager** 

**Enclosures** 

cc: Ron DiFrancesco, Golder Associates Inc. Martha Smith, Golder Associates Inc. Mike Williams, Golder Associates Inc







### **CERTIFICATIONS**

Project: Bremo Weekly Process

Pace Project No.: 92314512

**Ormond Beach Certification IDs** 

8 East Tower Circle, Ormond Beach, FL 32174

Alabama Certification #: 41320 Connecticut Certification #: PH-0216

Delaware Certification: FL NELAC Reciprocity

Florida Certification #: E83079 Georgia Certification #: 955

Guam Certification: FL NELAC Reciprocity Hawaii Certification: FL NELAC Reciprocity

Illinois Certification #: 200068

Indiana Certification: FL NELAC Reciprocity

Kansas Certification #: E-10383

Louisiana Certification #: FL NELAC Reciprocity Louisiana Environmental Certificate #: 05007

Maryland Certification: #346 Michigan Certification #: 9911

Mississippi Certification: FL NELAC Reciprocity

Missouri Certification #: 236 Montana Certification #: Cert 0074 Nebraska Certification: NE-OS-28-14

Nevada Certification: FL NELAC Reciprocity

New York Certification #: 11608

North Carolina Environmental Certificate #: 667

North Carolina Certification #: 12710 Oklahoma Certification #: D9947 Pennsylvania Certification #: 68-00547 Puerto Rico Certification #: FL01264 South Carolina Certification: #96042001 Tennessee Certification #: TN02974 Texas Certification: FL NELAC Reciprocity

US Virgin Islands Certification: FL NELAC Reciprocity Virginia Environmental Certification #: 460165

Wyoming Certification: FL NELAC Reciprocity

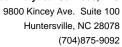
West Virginia Certification #: 9962C Wisconsin Certification #: 399079670

Wyoming (EPA Region 8): FL NELAC Reciprocity

**Eden Certification IDs** 

205 East Meadow Road Suite A, Eden, NC 27288

North Carolina Wastewater Certification #: 633 North Carolina Drinking Water Certification #: 37738 Virginia/VELAP Certification #: 460025





### **SAMPLE ANALYTE COUNT**

Project: Bremo Weekly Process

Pace Project No.: 92314512

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
92314512001	T2-161003-0945-\$3	ASTM D4282-02	KCE	1	PASI-E
		EPA 200.7	CKJ	8	PASI-O



9800 Kincey Ave. Suite 100 Huntersville, NC 28078 (704)875-9092

### **PROJECT NARRATIVE**

Project: Bremo Weekly Process

Pace Project No.: 92314512

Method: ASTM D4282-02 Description: Cyanide, Free

Client: Golder\_Dominion\_Bremo

Date: October 05, 2016

### **General Information:**

1 sample was analyzed for ASTM D4282-02. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### **Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### **Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

### **Additional Comments:**



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### **PROJECT NARRATIVE**

Project: Bremo Weekly Process

Pace Project No.: 92314512

Method: EPA 200.7
Description: 200.7 MET ICP

Client: Golder\_Dominion\_Bremo

**Date:** October 05, 2016

### **General Information:**

1 sample was analyzed for EPA 200.7. All samples were received in acceptable condition with any exceptions noted below or on the chain-of custody and/or the sample condition upon receipt form (SCUR) attached at the end of this report.

### **Hold Time:**

The samples were analyzed within the method required hold times with any exceptions noted below.

### **Sample Preparation:**

The samples were prepared in accordance with EPA 200.7 with any exceptions noted below.

### Initial Calibrations (including MS Tune as applicable):

All criteria were within method requirements with any exceptions noted below.

### **Continuing Calibration:**

All criteria were within method requirements with any exceptions noted below.

### Method Blank:

All analytes were below the report limit in the method blank, where applicable, with any exceptions noted below.

### **Laboratory Control Spike:**

All laboratory control spike compounds were within QC limits with any exceptions noted below.

### Matrix Spikes:

All percent recoveries and relative percent differences (RPDs) were within acceptance criteria with any exceptions noted below.

QC Batch: 324323

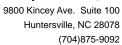
A matrix spike and/or matrix spike duplicate (MS/MSD) were performed on the following sample(s): 92314507001

M1: Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.

- MS (Lab ID: 1728841)
  - Barium
- MSD (Lab ID: 1728842)
  - Barium

### **Additional Comments:**

This data package has been reviewed for quality and completeness and is approved for release.





### **ANALYTICAL RESULTS**

Project: Bremo Weekly Process

Pace Project No.: 92314512

Date: 10/05/2016 11:41 AM

Sample: T2-161003-0945-S3	Lab ID: 923	14512001	Collected: 10/03/	16 09:45	Received: 10	0/03/16 12:10	Matrix: Water	•
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Cyanide, Free	Analytical Meth	od: ASTM	D4282-02					
Cyanide, Free	ND	mg/L	0.050	1		10/04/16 10:00	57-12-5	
200.7 MET ICP	Analytical Meth	od: EPA 20	0.7 Preparation Me	thod: EF	PA 200.7			
Aluminum	198	ug/L	100	1	10/04/16 13:44	10/04/16 17:3	4 7429-90-5	
Barium	337	ug/L	10.0	1	10/04/16 13:44	10/04/16 17:34	4 7440-39-3	
Beryllium	ND	ug/L	1.0	1	10/04/16 13:44	10/04/16 17:34	4 7440-41-7	
Boron	1670	ug/L	50.0	1	10/04/16 13:44	10/04/16 17:34	4 7440-42-8	
Cobalt	ND	ug/L	10.0	1	10/04/16 13:44	10/04/16 17:34	4 7440-48-4	
Iron	ND	ug/L	250	1	10/04/16 13:44	10/04/16 17:34	4 7439-89-6	
Molybdenum	153	ug/L	10.0	1	10/04/16 13:44	10/04/16 17:34	4 7439-98-7	
Vanadium	ND	ug/L	10.0	1	10/04/16 13:44	10/04/16 17:34	4 7440-62-2	



### **QUALITY CONTROL DATA**

Project: Bremo Weekly Process

Pace Project No.: 92314512

Date: 10/05/2016 11:41 AM

QC Batch: 331752 Analysis Method: ASTM D4282-02

QC Batch Method: ASTM D4282-02 Analysis Description: ASTM D4282 Free Cyanide

Associated Lab Samples: 92314512001

METHOD BLANK: 1837953 Matrix: Water

Associated Lab Samples: 92314512001

Blank Reporting
Parameter Units Result Limit Analyzed Qualifiers

Cyanide, Free mg/L ND 0.050 10/04/16 10:00

LABORATORY CONTROL SAMPLE: 1837954

Spike LCS LCS % Rec Parameter Units Conc. Result % Rec Limits Qualifiers Cyanide, Free mg/L 0.10 100 90-110

MATRIX SPIKE & MATRIX SPIKE DUPLICATE: 1837955 1837956

MS MSD 92314516002 Spike Spike MS MSD MS MSD % Rec Parameter Units Result Conc. Conc. Result Result % Rec % Rec Limits RPD Qual Cyanide, Free ND 90-110 mg/L .1 .1 0.10 0.10 98 98 0

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.



### **QUALITY CONTROL DATA**

Project: Bremo Weekly Process

Pace Project No.: 92314512

Date: 10/05/2016 11:41 AM

QC Batch: 324323 Analysis Method: EPA 200.7
QC Batch Method: EPA 200.7 Analysis Description: 200.7 MET

Associated Lab Samples: 92314512001

METHOD BLANK: 1728839 Matrix: Water

Associated Lab Samples: 92314512001

		Blank	Reporting		
Parameter	Units	Result	Limit	Analyzed	Qualifiers
Aluminum	ug/L	ND ND	100	10/04/16 17:05	
Barium	ug/L	ND	10.0	10/04/16 17:05	
Beryllium	ug/L	ND	1.0	10/04/16 17:05	
Boron	ug/L	ND	50.0	10/04/16 17:05	
Cobalt	ug/L	ND	10.0	10/04/16 17:05	
Iron	ug/L	ND	250	10/04/16 17:05	
Molybdenum	ug/L	ND	10.0	10/04/16 17:05	
Vanadium	ug/L	ND	10.0	10/04/16 17:05	

		Spike	LCS	LCS	% Rec	
Parameter	Units	Conc.	Result	% Rec	Limits	Qualifiers
Aluminum	ug/L	2500	2470	99	85-115	
Barium	ug/L	250	256	102	85-115	
Beryllium	ug/L	25	24.6	99	85-115	
Boron	ug/L	2500	2480	99	85-115	
Cobalt	ug/L	250	266	107	85-115	
Iron	ug/L	2500	2490	99	85-115	
Molybdenum	ug/L	250	259	104	85-115	
Vanadium	ug/L	250	254	102	85-115	

MATRIX SPIKE & MATRIX SPI	KE DUPLICAT	E: 17288	41		1728842						
			MS	MSD							
	923	314507001	Spike	Spike	MS	MSD	MS	MSD	% Rec		
Parameter	Units	Result	Conc.	Conc.	Result	Result	% Rec	% Rec	Limits	RPD	Qual
Aluminum	ug/L	190	2500	2500	2570	2590	95	96	70-130	1	
Barium	ug/L	324	250	250	675	691	140	147	70-130	2 M	l
Beryllium	ug/L	ND	25	25	24.2	25.2	97	101	70-130	4	
Boron	ug/L	1600	2500	2500	4180	4340	103	110	70-130	4	
Cobalt	ug/L	ND	250	250	250	257	100	103	70-130	2	
Iron	ug/L	ND	2500	2500	2530	2550	97	98	70-130	1	
Molybdenum	ug/L	147	250	250	436	451	116	121	70-130	3	
Vanadium	ug/L	ND	250	250	257	268	101	106	70-130	4	

Results presented on this page are in the units indicated by the "Units" column except where an alternate unit is presented to the right of the result.

### **REPORT OF LABORATORY ANALYSIS**

This report shall not be reproduced, except in full, without the written consent of Pace Analytical Services, LLC.



### **QUALIFIERS**

Project: Bremo Weekly Process

Pace Project No.: 92314512

### **DEFINITIONS**

DF - Dilution Factor, if reported, represents the factor applied to the reported data due to dilution of the sample aliquot.

ND - Not Detected at or above adjusted reporting limit.

J - Estimated concentration above the adjusted method detection limit and below the adjusted reporting limit.

MDL - Adjusted Method Detection Limit.

PQL - Practical Quantitation Limit.

RL - Reporting Limit.

S - Surrogate

1,2-Diphenylhydrazine decomposes to and cannot be separated from Azobenzene using Method 8270. The result for each analyte is a combined concentration.

Consistent with EPA guidelines, unrounded data are displayed and have been used to calculate % recovery and RPD values.

LCS(D) - Laboratory Control Sample (Duplicate)

MS(D) - Matrix Spike (Duplicate)

**DUP - Sample Duplicate** 

RPD - Relative Percent Difference

NC - Not Calculable.

SG - Silica Gel - Clean-Up

U - Indicates the compound was analyzed for, but not detected.

Acid preservation may not be appropriate for 2 Chloroethylvinyl ether.

A separate vial preserved to a pH of 4-5 is recommended in SW846 Chapter 4 for the analysis of Acrolein and Acrylonitrile by EPA Method 8260.

N-Nitrosodiphenylamine decomposes and cannot be separated from Diphenylamine using Method 8270. The result reported for each analyte is a combined concentration.

Pace Analytical is TNI accredited. Contact your Pace PM for the current list of accredited analytes.

TNI - The NELAC Institute.

### **LABORATORIES**

PASI-E Pace Analytical Services - Eden

PASI-O Pace Analytical Services - Ormond Beach

### **ANALYTE QUALIFIERS**

Date: 10/05/2016 11:41 AM

M1 Matrix spike recovery exceeded QC limits. Batch accepted based on laboratory control sample (LCS) recovery.



9800 Kincey Ave. Suite 100 Huntersville, NC 28078 (704)875-9092

### **QUALITY CONTROL DATA CROSS REFERENCE TABLE**

Project: Bremo Weekly Process

Pace Project No.: 92314512

Date: 10/05/2016 11:41 AM

Lab ID	Sample ID	QC Batch Method	QC Batch	Analytical Method	Analytical Batch
92314512001	T2-161003-0945-S3	ASTM D4282-02	331752		· · · · · · · · · · · · · · · · · · ·
92314512001	T2-161003-0945-S3	EPA 200.7	324323	EPA 200.7	324327

## Pace Analytical\*

Out of hold, incorrect preservative, out of temp, incorrect containers)

### Document Name: Sample Condition Upon Receipt(SCUR)

Document No.: F-MEC-CS-009-Rev.03

Document Revised: May 24, 2016 Page 1 of 2

Issuing Authority:
Pace Mechanicsville Quality Office

Page 2 of 2 for Internal Use ONLY

Courier:  Commercial  Custody Seal Present?  Client Name:  Fed Ex  Pace  Ves  No Seals	DV C			Project #: WO#: 92314512    Client
Packing Material: Bubble Wrap Bubble Wrap Thermometer:  Correction Factor: 0.0°C Cooler Temp Corrected (°C) Temp should be above freezing to 6°C USDA Regulated Soil ( N/A, water sample) Did samples originate in a quarantine zone within the United Yes No		2	Wet	Date/Initials Person Examining Contents: 10-3-14 Other:
Chain of Custody Present?	Nyos	□No	□N/A	1.
Samples Arrived within Hold Time?	V Yes ✓ Yes		□N/A	2.
Short Hold Time Analysis (<72 hr.)?		1	W. C.	3.
Rush Turn Around Time Requested?	Yes	☑No □No	N/A N/A	4.
Sufficient Volume?	Yes		□N/A	5.
Correct Containers Used?	Yes	□No	□N/A	6.
-Pace Containers Used?		□No	□N/A	0.
	√,Yes	5250		7.
Containers Intact?	▼Yes	□No	□N/A	
Samples Field Filtered?	Yes	□No	☑N/A	
Sample Labels Match COC?	☑Yes \	□No	□N/A	9.
-Includes Date/Time/ID/Analysis Matrix:  All containers needing acid/base preservation have been checked? All containers needing preservation are found to be in compliance with EPA recommendation?	V √Yes	ÜNo	□n/a	10. HNC3 pHc2 HC3 pHc2 H2504 pHc2
(HNO₃, H₂SO₄, HCI<2; NaOH >9 Sulfide, NaOH>12 Cyanide)	Yes	□No	□N/A	NaOH pH>12
Exceptions: VOA, Coliform, TOC, Oil and Grease, DRO/8015 (water) DOC,LLHg	□Yes	□No	□N/A	NaOH/ZnOAc pH>9
Samples checked for dechlorination?	Yes	□No	N/A	11.
Headspace in VOA Vials (>5-6mm)?	Yes	□No	N/A	12.
Trip Blank Present?	□Yes	□No	□N/A	13.
Trip Blank Custody Seals Present?	□Yes	□No	N/A	
Pace Trip Blank Lot # (if purchased):				
CLIENT NOTIFICATION/RESOLUTION				Field Data Required? Yes No
Person Contacted: Comments/Sample Discrepancy:				Date/Time:
Project Manager SCURF Review:		NM	6	Date:
Project Manager SRF Review:  Note: Whenever there is a discrepancy affecting North Carolin	a complian	Ce sample	16 es, a copy	of this form will be sent to the North Carolina DEHNR Certification Office (i.e.

# \*Important Note: By signing this form you are accepting Pace's NET 30 day payment terms and agreeing to late charges of 1.5% per month for any invoices not paid within 30 days.

# F-ALL-Q-020rev.08, 12-Oct-2007

CHAIN-OF-CUSTODY / Analytical Request Document
The Chain-of-Custody is a LEGAL DOCUMENT. All relevant fields must be completed accurately.

Pace Analytical

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